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Comparator choice in cariology trials limits conclusions on the comparative effectiveness of caries interventions

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Appendix Table 2: Excluded studies table, with reason for exclusion

Reference	Main Reason for Exclusion
(1)	not in english
(2)	not randomised controlled trial
(3)	article not available
(4)	not randomised controlled trial
(5)	not in english
(6)	article not available
(7)	article not available
(8)	not randomised controlled trial
(9)	article not available
(10)	not randomised controlled trial
(11)	not randomised controlled trial
(12)	not randomised controlled trial
(13)	not randomised controlled trial
(14)	in vitro/not clinical/non human
(15)	not in english
(16)	not randomised controlled trial
(17)	not in english
(18)	not randomised controlled trial
(19)	not randomised controlled trial
(20)	not in english
(21)	not randomised controlled trial
(22)	not randomised controlled trial
(23)	unable to extract data - inadequately reported
(24)	not randomised controlled trial
(25)	not in english
(26)	not randomised controlled trial
(27)	not randomised controlled trial

(28)	article not available
(29)	not randomised controlled trial
(30)	not randomised controlled trial
(31)	not randomised controlled trial
(32)	not randomised controlled trial
(33)	article not available
(34)	not randomised controlled trial
(35)	not randomised controlled trial
(36)	article not available
(37)	not randomised controlled trial
(38)	article not available
(39)	article not available
(40)	not randomised controlled trial
(41)	article not available
(42)	article not available
(43)	article not available
(44)	not randomised controlled trial
(45)	article not available
(46)	article not available
(47)	article not available
(48)	not randomised controlled trial
(49)	not randomised controlled trial
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(51)	not randomised controlled trial
(52)	not randomised controlled trial
(53)	article not available
(54)	not randomised controlled trial
(55)	not randomised controlled trial
(56)	article not available
(57)	not randomised controlled trial

(58)	Caries free participants
(59)	article not available
(60)	not randomised controlled trial
(61)	article not available
(62)	article not available
(63)	not randomised controlled trial
(64)	not in english
(65)	not randomised controlled trial
(66)	in vitro/not clinical/non human
(67)	not randomised controlled trial
(68)	not randomised controlled trial
(69)	article not available
(70)	in vitro/not clinical/non human
(71)	not randomised controlled trial
(72)	not randomised controlled trial
(73)	not randomised controlled trial
(74)	Caries free participants
(75)	not randomised controlled trial
(76)	not randomised controlled trial
(77)	in vitro/not clinical/non human
(78)	not randomised controlled trial
(79)	in vitro/not clinical/non human
(80)	not randomised controlled trial
(81)	not randomised controlled trial
(82)	not randomised controlled trial
(83)	article not available
(84)	article not available
(85)	article not available
(86)	Caries free participants
(87)	not randomised controlled trial

(88)	not randomised controlled trial
(89)	not randomised controlled trial
(90)	not randomised controlled trial
(91)	article not available
(92)	not randomised controlled trial
(93)	in vitro/not clinical/non human
(94)	article not available
(95)	in vitro/not clinical/non human
(96)	not randomised controlled trial
(97)	not in english
(98)	not randomised controlled trial
(99)	not randomised controlled trial
(100)	not randomised controlled trial
(101)	not randomised controlled trial
(102)	not randomised controlled trial
(103)	not randomised controlled trial
(104)	in vitro/not clinical/non human
(105)	article not available
(106)	in vitro/not clinical/non human
(107)	not randomised controlled trial
(108)	not randomised controlled trial
(109)	article not available
(110)	not randomised controlled trial
(111)	not randomised controlled trial
(112)	Caries free participants
(113)	not randomised controlled trial
(114)	not randomised controlled trial
(115)	article not available
(116)	not in english
(117)	analysis of Practice compliance

(118)	not randomised controlled trial
(119)	not randomised controlled trial
(120)	not randomised controlled trial
(121)	not randomised controlled trial
(122)	not randomised controlled trial
(123)	not randomised controlled trial
(124)	in vitro/not clinical/non human
(125)	not randomised controlled trial
(126)	not randomised controlled trial
(127)	Caries free participants
(128)	not randomised controlled trial
(129)	article not available
(130)	not randomised controlled trial
(131)	not randomised controlled trial
(132)	not randomised controlled trial
(133)	in vitro/not clinical/non human
(134)	Caries free participants
(135)	in vitro/not clinical/non human
(136)	Caries free participants
(137)	not randomised controlled trial
(138)	not in english
(139)	article not available
(140)	article not available
(141)	not randomised controlled trial
(142)	not randomised controlled trial
(143)	not randomised controlled trial
(144)	not in english
(145)	Caries free participants
(146)	not randomised controlled trial
(147)	not randomised controlled trial

(148)	not randomised controlled trial
(149)	not randomised controlled trial
(150)	Caries free participants
(151)	not randomised controlled trial
(152)	not randomised controlled trial
(153)	in vitro/not clinical/non human
(154)	not randomised controlled trial
(155)	not randomised controlled trial
(156)	not in english
(157)	not randomised controlled trial
(158)	Caries free participants
(159)	not in english

1. R. M. Frank, J. Sommermater and J. L. Lacoste. [Clinical trial for the prevention of dental caries by sealing the fissures]. Schweizerische Monatsschrift fur Zahnheilkunde = Revue mensuelle suisse d'odonto-stomatologie / SSO 1971; 81(6): 543-4.

2. W. P. Rock. Fissure Sealants - Results Obtained with 2 Different Bis-Gma Type Sealants after One Year. British Dental Journal 1973; 134(5): 193-6.

3. V. Qvist, L. Johannessen, U. Hjortenberget and H. Lambjerg-Hansen. [Clinical comparative study of a silicate cement and three composite resins]. Tandlaegebladet 1974; 78(21): 896-902.

4. J. H. Meurman, H. Luoma, H. Heikkila and P. Rautio. Caries reduction 1.5 years after application of a fissure sealant as related to dietary habits. Scand J Dent Res 1975; 83(1): 1-6.

5. P. Riethe and F. Maupai. [Clinical studies on fissure sealants of the Bis-GMA type]. Dtsch Zahnarztl Z 1975; 30(8): 502-7.

6. K. Badzian-Kobos and D. Cichocka. [Evaluation of dental caries treatment of permanent incisors in children 10-12 years old]. Czas Stomatol 1976; 29(2): 103-8.

7. S. t. Kraiovski, A. Kodukova and R. Todorova. [Results of the use of fluoridated amalgam in the treatment of dental caries]. Stomatologiya. Stomatology 1976; 58(4): 278-82.

8. N. O. Harris, L. Moolenaar, N. Hornberger, G. H. Knight and R. A. Frew. Adhesive sealant clinical trial: effectiveness in a school population of the U.S. Virgin Islands. The Journal of preventive dentistry 1976;

3(3 Pt 2): 27-37.

9. G. S. Leske, S. Pollard and N. Cons. The effectiveness of dental hygienist teams in applying a pit and fissure sealant. *The Journal of preventive dentistry* 1976; 3(2): 33-6.

10. A. Scheinin. Caries control through the use of sugar substitutes. *International dental journal* 1976; 26(1): 4-13.

11. A. Scheinin. Xylitol in relation to the incidence of dental caries. *Internationale Zeitschrift für Vitamin- und Ernährungsforschung. Beiheft* 1976; 15(): 358-67.

12. V. Whitehurst and N. N. Soni. Adhesive sealant clinical trial: results eighteen months after one application. *The Journal of preventive dentistry* 1976; 3(): 3 Pt 2.

13. R. J. Simonsen and R. E. Stallard. Sealant-restorations utilizing a diluted filled composite resin: one year results. *Quintessence international, dental digest* 1977; 8(6): 77-84.

14. L. Forsten and S. Karjalainen. Effect of a Ca(OH)₂ solution and a chlorhexidine based detergent on the microbial activity of human carious teeth. *Acta Odontol Scand* 1977; 35(6): 275-80.

15. P. Rieth, W. Streib and G. Schubring. Clinical studies of Nuva Seal, Epoxylite 9070 and Fluor-Protector. *Deutsche zahnärztliche Zeitschrift* 1977; 32(11): 853-5.

16. W. A. Doyle and J. A. Brose. A five-year study of the longevity of fissure sealants. *ASDC journal of dentistry for children* 1978; 45(2): 127-9.

17. P. Hotz, H. W. Hofstetter and U. J. Rohrbach. [Fissure sealing combined with enamel fluoridation. Follow-up study 2 year after sealing]. *Schweizerische Monatsschrift Für Zahnheilkunde* 1978; 88(4): 313-23.

18. R. D. Battock, J. Rhoades and M. R. Lund. Management of proximal caries on the roots of posterior teeth. *Oper Dent* 1979; 4(3): 108-12.

19. E. J. Mertz-Fairhurst, G. S. Schuster, J. E. Williams and C. W. Fairhurst. Clinical progress of sealed and unsealed caries. Part II: Standardized radiographs and clinical observations. *J Prosthet Dent* 1979; 42(6): 633-7.

20. C. Baroni, G. Dondi Dall'orologio and G. Piana. [Sealants in prevention of dental caries: initial results]. *Arch Stomatol (Napoli)* 1979; 20(4): 625-33.

21. . Hypothetical protocol: clinical field trial title: a comparative study of sealants, amalgam restorations and fluoride rinsing of teeth on the progression and prevention of carious lesions. *Journal of dental research* 1980; 59(Spec Issue C): 1240-2.

22. L. Kolehmainen. Evaluation of a fluoride-containing varnish in children with low caries incidence. *Scand J Dent Res* 1981; 89(3): 228-34.

23. B. A. Richardson, D. C. Smith and J. A. Hargreaves. A 5-year clinical evaluation of the effectiveness of a fissure sealant in mentally retarded Canadian children. *Community Dent Oral Epidemiol* 1981; 9(4): 170-4.
24. W. P. Rock and G. Bradnock. Effect of Operator Variability and Patient Age on the Retention of Fissure Sealant Resin - 3-Year Results. *Community Dentistry and Oral Epidemiology* 1981; 9(5): 207-9.
25. N. Romand-Roeloffs, J. Holz and L. J. Baume. [Clinical behavior after 1 year of 4 white light-polymerized composites]. *Schweizerische Monatsschrift fur Zahnheilkunde = Revue mensuelle suisse d'odonto-stomatologie / SSO* 1983; 93(11): 1047-67.
26. J. C. Horiot, S. Schraub, M. C. Bone, Y. Bain, J. Ramadier, G. Chaplain, N. Nabid, B. Thevenot and D. Bransfield. Dental preservation in patients irradiated for head and neck tumours: A 10-year experience with topical fluoride and a randomized trial between two fluoridation methods. *Radiother Oncol* 1983; 1(1): 77-82.
27. L. W. Ripa, G. S. Leske, A. Sposato and T. Rebich. Supervised weekly rinsing with a 0.2 percent neutral NaF solution: final results of a demonstration program after six school years. *J Public Health Dent* 1983; 43(1): 53-62.
28. K. Joelson, P. Herr, J. Holz and L. J. Baume. [Clinical evaluation of 4 composite resins after 3 years in the mouth]. *Schweizerische Monatsschrift fur Zahnheilkunde = Revue mensuelle suisse d'odonto-stomatologie / SSO* 1983; 93(3): 139-51.
29. G. S. Rao. Safety and Efficacy of Dental Sealants in the Prevention of Tooth-Decay. *Journal of Pharmaceutical Sciences* 1984; 73(11): 1675-1675.
30. R. J. Elderton. Management of early dental caries in fissures with fissure sealant. *Br Dent J* 1985; 158(7): 254-8.
31. L. H. Straffon, J. B. Dennison and F. G. More. Three-year evaluation of sealant: effect of isolation on efficacy. *J Am Dent Assoc* 1985; 110(5): 714-7.
32. E. Jodkowska. [Effectiveness of sealing measures on the chewing surface of permanent teeth in clinical evaluation. II: Caries reduction]. *Stomatologie der DDR* 1985; 35(5): 275-9.
33. M. Saifullina Kh, P. A. Kovtoniuk and R. Z. Urazova. [Effectiveness of remineralization therapy in caries of the deciduous teeth]. *Stomatologiya (Mosk)* 1986; 65(6): 20-3.
34. L. Holmen, A. Thylstrup and J. Artun. Clinical and histological features observed during arrestment of active enamel carious lesions in vivo. *Caries Res* 1987; 21(6): 546-54.
35. E. Johansen, A. Papas, W. Fong and T. O. Olsen. Remineralization of carious lesions in elderly patients. *Gerodontology* 1987; 3(1): 47-50.
36. I. Hoyer, P. Gaengler and S. Niemela. Clinical Comparison of Composite Restorations and Amalgam Restorations after 4 Years. *Zahn- Mund- und Kieferheilkunde* 1988; 76(7): 721-726.

37. H. Gisselsson, D. Birkhed and A. L. Björn. Effect of professional flossing with chlorhexidine gel on approximal caries in 12- to 15-year-old schoolchildren. *Caries research* 1988; 22(3): 187-92.
38. M. Levinkind and D. Auger. A Double-Blind Clinical-Trial to Determine the Importance of Pumice Prophylaxis on Fissure Sealant Retention. *British Dental Journal* 1988; 165(12): 422.
39. M. X. Molina, F. G. Rodriguez, T. Urbina and S. Vargas. [Effect of weekly mouthrinses with 0.2% neutral NaF solution on caries incidence in first permanent molars]. *Odontol Chil* 1989; 37(1): 176-82.
40. A. M. Barrie, K. W. Stephen and E. J. Kay. Fissure sealant retention: a comparison of three sealant types under field conditions. *Community Dent Health* 1990; 7(3): 273-7.
41. S. Kneist, R. Heinrich and W. Kunzel. [The microbial colonization of the dentin close to the pulp in the permanent teeth following deep caries therapy]. *Zahn Mund Kieferheilkd Zentralbl* 1990; 78(8): 695-8.
42. A. Bayona González, V. López Cámara and A. Gómez Castellanos. [Prevention of caries with lactobacillus (final results of a clinical trial on dental caries with killed lactobacillus [streptococcus and lactobacillus] given orally)]. *Práctica odontológica* 1990; 11(7): 37-9, 42-3, 45-6.
43. K. Hepp, I. Tarjan and I. Bodoki. [Comparative study of the fissure sealants Concise and Delton]. *Fogorv Sz* 1990; 83(11): 337-9.
44. I. Mejare and I. A. Mjor. Glass ionomer and resin-based fissure sealants: a clinical study. *Scand J Dent Res* 1990; 98(4): 345-50.
45. A. Borutta, W. Kunzel and F. Rubsam. [The caries-protective efficacy of 2 fluoride varnishes in a 2-year controlled clinical trial]. *Dtsch Zahn Mund Kieferheilkd Zentralbl* 1991; 79(7): 543-9.
46. J. C. Llodra Calvo and P. Baca Garcia. [Absolute or relative isolation for fissure sealants? 12-month clinical study]. *Av Odontoestomatol* 1991; 7(3): 181-5.
47. A. Nord and O. Haugejorden. [Two-year trial of the fluoride-containing varnishes Duraphat and Carex]. *Den Norske tannlaegeforenings tidende* 1991; 101(2): 46-9.
48. R. J. Simonsen. Retention and effectiveness of dental sealant after 15 years. *J Am Dent Assoc* 1991; 122(10): 34-42.
49. R. M. Duckworth, S. N. Morgan and R. J. Gilbert. Oral fluoride measurements for estimation of the anti-caries efficacy of fluoride treatments. *J Dent Res* 1992; 71 Spec No(): 836-40.
50. M. Madlena, S. Kincses, M. Alberth and G. Keszthelyi. [Short-term effectiveness of fissure sealants]. *Fogorv Sz* 1993; 86(1): 15-21.
51. P. Weinstein, P. Domoto, M. Koday and B. Leroux. Results of a promising open trial to prevent baby bottle tooth decay: a fluoride varnish study. *ASDC J Dent Child* 1994; 61(5-6): 338-41.

52. I. G. Chestnutt, F. Schäfer, A. P. Jacobson and K. W. Stephen. The prevalence and effectiveness of fissure sealants in Scottish adolescents. *British dental journal* 1994; 177(4): 125-9.
53. M. Bravo Perez, J. C. Llodra Calvo, P. Baca Garcia, E. Osorio Ruiz and P. Junco Lafuente. [Fissure sealants versus fluorine varnish on the first permanent molars: economic assessment]. *Aten Primaria* 1995; 15(3): 143-7.
54. R. H. Selwitz, R. Nowjack-Raymer, W. S. Driscoll and S. H. Li. Evaluation after 4 years of the combined use of fluoride and dental sealants. *Community Dent Oral Epidemiol* 1995; 23(1): 30-5.
55. T. Gotjamanos. Pulp response in primary teeth with deep residual caries treated with silver fluoride and glass ionomer cement ('atraumatic' technique). *Aust Dent J* 1996; 41(5): 328-34.
56. C. J. Kleber, M. S. Putt, C. E. Smith and C. W. Gish. Effect of supervised use of an alum mouthrinse on dental caries incidence in caries-susceptible children: a pilot study. *ASDC J Dent Child* 1996; 63(6): 393-402.
57. K. K. Makinen, P. P. Hujoel, C. A. Bennett, K. P. Isotupa, P. L. Makinen and P. Allen. Polyol chewing gums and caries rates in primary dentition: a 24-month cohort study. *Caries Res* 1996; 30(6): 408-17.
58. M. I. Valente, G. Seabra, C. Chiesa, R. Almeida, C. Djahjah, C. Fonseca, E. Villar do Valle and W. A. Bretz. Effects of a chlorhexidine varnish on the gingival status of adolescents. *J Can Dent Assoc* 1996; 62(1): 46-8.
59. B. Williams, L. Laxton, R. D. Holt and G. B. Winter. Fissure sealants: a 4-year clinical trial comparing an experimental glass polyalkenoate cement with a bis glycidyl methacrylate resin used as fissure sealants. *British dental journal* 1996; 180(3): 104-8.
60. S. Karjalainen, L. Sewon, E. Soderling, H. Lapinleimu, R. Seppanen and O. Simell. Oral health of 3-year-old children and their parents after 29 months of child-focused antiatherosclerotic dietary intervention in a prospective randomized trial. *Caries Res* 1997; 31(3): 180-5.
61. A. Brugnera Junior, N. Rosso, D. Duarte, A. C. Pinto and W. Genovese. The use of carbon dioxide laser in pit and fissure caries prevention: clinical evaluation. *J Clin Laser Med Surg* 1997; 15(2): 79-82.
62. R. L. Glass and M. N. Naylor. A clinical trial of two fluoride dentifrices in an area of low caries prevalence. *Community dental health* 1997; 14(2): 74-8.
63. P. K. Mallow, C. S. Durward and M. Klaipo. Restoration of permanent teeth in young rural children in Cambodia using the atraumatic restorative treatment (ART) technique and Fuji II glass ionomer cement. *International journal of paediatric dentistry / the British Paedodontic Society [and] the International Association of Dentistry for Children* 1998; 8(1): 35-40.
64. J. Szabó, B. Herczegh, D. Márk, E. Tóth and J. Bánóczy. [Comparative clinical study of amalgam fillings]. *Fogorvosi szemle* 1998; 91(8-9): 285-91.
65. L. Boksman and B. Carson. Two-year retention and caries rates of UltraSeal XT and FluoroShield

light-cured pit and fissure sealants. *Gen Dent* 1998; 46(2): 184-7.

66. K. Gupta, A. Tewari, A. Sahni, H. S. Chawla and K. Gauba. Remineralizing efficacy of a mineral enriched mouth rinse and fluoridated dentifrice on artificial carious lesions: an in vivo scanning electron microscopic study. *J Indian Soc Pedod Prev Dent* 1998; 16(3): 67-71.

67. D. Hu, H. Wan and S. Li. The caries-inhibiting effect of a fluoride drop program: a 3-year study on Chinese kindergarten children. *Chin J Dent Res* 1998; 1(3): 17-20.

68. K. K. Makinen, P. P. Hujoel, C. A. Bennett, P. Isokangas, K. Isotupa, H. R. Pape, Jr. and P. L. Makinen. A descriptive report of the effects of a 16-month xylitol chewing-gum programme subsequent to a 40-month sucrose gum programme. *Caries Res* 1998; 32(2): 107-12.

69. M. V. Morgan, A. C. Campain, G. G. Adams, S. J. Crowley and F. A. Wright. The efficacy and effectiveness of a primary preventive dental programme in non-fluoridated areas of Victoria, Australia. *Community-Dent-Health* 1998; 15(4): 263-7.

70. D. J. Caplan, G. D. Slade, A. R. Biesbrock, R. D. Bartizek, S. F. McClanahan and J. D. Beck. A comparison of increment and incidence density analyses in evaluating the anticaries effects of two dentifrices. *Caries Res* 1999; 33(1): 16-22.

71. A. C. Pereira, R. T. Basting, C. Pinelli, M. de Castro Meneghim and C. W. Werner. Retention and caries prevention of Vitremer and Ketac-bond used as occlusal sealants. *Am J Dent* 1999; 12(2): 62-4.

72. K. W. Stephen, L. M. Macpherson, I. Gorzo and W. H. Gilmour. Effect of fluoridated salt intake in infancy: a blind caries and fluorosis study in 8th grade Hungarian pupils. *Community Dent Oral Epidemiol* 1999; 27(3): 210-5.

73. G. B. Gray. An evaluation of sealant restorations after 2 years. *British dental journal* 1999; 186(11): 569-75.

74. M. Folwaczny, C. Loher, A. Mehl, K. H. Kunzelmann and R. Hinkel. Tooth-colored filling materials for the restoration of cervical lesions: a 24-month follow-up study. *Operative dentistry* 2000; 25(4): 251-8.

75. A. S. Aaltonen, J. T. Suhonen, J. Tenovuo and I. Inkila-Saari. Efficacy of a slow-release device containing fluoride, xylitol and sorbitol in preventing infant caries. *Acta Odontol Scand* 2000; 58(6): 285-92.

76. C. Kallestal, A. Flinck, P. Allebeck, A. K. Holm and S. Wall. Evaluation of caries preventive measures. *Swed Dent J* 2000; 24(1-2): 1-11.

77. L. Zhang, Z. Li and Y. Dong. Experimental study of phosphopeptide in promoting tooth remineralization. *Chin J Dent Res* 2000; 3(1): 27-30.

78. D. K. Ratledge, E. A. Kidd and D. Beighton. A clinical and microbiological study of approximal carious lesions. Part 1: the relationship between cavitation, radiographic lesion depth, the site-specific gingival index and the level of infection of the dentine. *Caries research* 2001; 35(1): 8-11.

79. S. Imazato, Y. Torii, T. Takatsuka, K. Inoue, N. Ebi and S. Ebisu. Bactericidal effect of dentin primer containing antibacterial monomer methacryloyloxydodecylpyridinium bromide (MDPB) against bacteria in human carious dentin. *J Oral Rehabil* 2001; 28(4): 314-9.
80. M. P. Kukleva and V. K. Kondeva. Dynamics of caries activity and caries reduction in group prophylaxis with fluoride gel. *Folia Med (Plovdiv)* 2001; 43(1-2): 12-5.
81. L. K. Wendt, E. Carlsson, A. L. Hallonsten and D. Birkhed. Early dental caries risk assessment and prevention in pre-school children: evaluation of a new strategy for dental care in a field study. *Acta Odontol Scand* 2001; 59(5): 261-6.
82. A. Yoshihara, S. Sakuma, S. Kobayashi and H. Miyazaki. Antimicrobial effect of fluoride mouthrinse on mutans streptococci and lactobacilli in saliva. *Pediatr Dent* 2001; 23(2): 113-7.
83. A. E. Boneta, A. Neesmith, S. Mankodi, H. J. Berkowitz, L. Sánchez, K. Mostler, B. Stewart, J. Sintes, W. Vizio, M. E. Petrone, A. R. Volpe, Y. P. Zhang, J. J. McCool, E. Bustillo and H. M. Proskin. The enhanced anticaries efficacy of a sodium fluoride and dicalcium phosphate dihydrate dentifrice in a dual-chambered tube. A 2-year caries clinical study on children in the United States of America. *American journal of dentistry* 2001; 14 Spec No(): 19A-23A.
84. A. C. Pereira, V. Pardi, R. T. Basting, M. C. Menighim, C. Pinelli, G. M. Ambrosano and F. García-Godoy. Clinical evaluation of glass ionomers used as fissure sealants: twenty-four-month results. *ASDC journal of dentistry for children* 2001; 68(3): 168-74.
85. Y. Wu, Z. Shi and J. Shi. Randomized controlled trial study for preventing dental fear during caries treatments. *Zhonghua kou qiang yi xue za zhi [Chinese journal of stomatology]* 2002; 37(5): 343-5.
86. A. A. El-Housseiny and N. Farsi. Sealing ability of a single bond adhesive in primary teeth. An in vivo study. *Int J Paediatr Dent* 2002; 12(4): 265-70.
87. M. P. Kukleva. Changes in the appearance and form of the spots of macula cariosa alba in treatment with fluoride gel. *Folia Med (Plovdiv)* 2002; 44(1-2): 64-9.
88. M. P. Kukleva. Treatment of incipient caries in children with fluoride gel. *Folia Med (Plovdiv)* 2002; 44(1-2): 50-5.
89. V. Machiulskiene, A. Richards, B. Nyvad and V. Baelum. Prospective study of the effect of post-brushing rinsing behaviour on dental caries. *Caries Res* 2002; 36(5): 301-7.
90. D. Mulyani and J. McIntyre. Caries inhibitory effect of fluoridated sugar in a trial in Indonesia. *Aust Dent J* 2002; 47(4): 314-20.
91. J. T. Autio-Gold. Clinical evaluation of a medium-filled flowable restorative material as a pit and fissure sealant. *Oper Dent* 2002; 27(4): 325-9.
92. J. Y. Bian, W. H. Wang, W. J. Wang, W. S. Rong and E. C. Lo. Effect of fluoridated milk on caries in primary teeth: 21-month results. *Community Dent Oral Epidemiol* 2003; 31(4): 241-5.

93. J. Gorton and J. D. Featherstone. In vivo inhibition of demineralization around orthodontic brackets. *Am J Orthod Dentofacial Orthop* 2003; 123(1): 10-4.
94. C. E. Ketley, J. L. West and M. A. Lennon. The use of school milk as a vehicle for fluoride in Knowsley, UK; an evaluation of effectiveness. *Community Dent Health* 2003; 20(2): 83-8.
95. J. M. Tanzer, J. Pellegrino, A. M. Thompson and R. M. Buch. Verification of caries inhibition by a tartar control toothpaste. *J Clin Dent* 2003; 14(3): 74-6.
96. N. Oscarson, C. Källestål, A. Fjelddahl and L. Lindholm. Cost-effectiveness of different caries preventive measures in a high-risk population of Swedish adolescents. *Community dentistry and oral epidemiology* 2003; 31(3): 169-78.
97. H. H. Liu. [Application of saucer shaped cavity and retentive groves in class II cavity restoration]. *Shanghai kou qiang yi xue [Shanghai journal of stomatology]* 2004; 13(4): 340-2.
98. M. D. Turgut, M. Tekcicek and S. Olmez. Clinical evaluation of a polyacid-modified resin composite under different conditioning methods in primary teeth. *Oper Dent* 2004; 29(5): 515-23.
99. A. Lawrence. Dental health educators in general practice have small impact. *Evid Based Dent* 2004; 5(1): 15.
100. J. Vanobbergen, D. Declerck, S. Mwalili and L. Martens. The effectiveness of a 6-year oral health education programme for primary schoolchildren. *Community Dent Oral Epidemiol* 2004; 32(3): 173-82.
101. M. Staninec, N. Artiga, S. A. Gansky, G. W. Marshall and S. Eakle. Bonded amalgam sealants and adhesive resin sealants: five-year clinical results. *Quintessence international (Berlin, Germany : 1985)* 2004; 35(5): 351-7.
102. F. Albani, I. Ballesio, V. Campanella and G. Marzo. Pit and fissure sealants: results at five and ten years. *Eur J Paediatr Dent* 2005; 6(2): 61-5.
103. M. C. Sunico, K. Shinkai and Y. Katoh. Two-year clinical performance of occlusal and cervical giomer restorations. *Oper Dent* 2005; 30(3): 282-9.
104. L. Casagrande, V. de Hipolito, M. F. de Goes, J. S. Barata, F. Garcia-Godoy and F. B. de Araujo. Bond strength and failure patterns of adhesive restorations in primary teeth aged in the oral environment. *Am J Dent* 2006; 19(5): 279-82.
105. P. A. Samra-Quintero, C. Bernardoni-Socorro, A. M. Borjas, N. R. Fuenmayor, J. Estévez and M. Arteaga-Vizcaíno. Changes in blood pressure in children undergoing psychological treatment before dental procedures. *Acta odontológica latinoamericana : AOL* 2006; 19(1): 9-12.
106. M. J. Altenburger, M. Klasser, J. F. Schirrmeister and E. Hellwig. Remineralisation of carious enamel lesions after application of a CHX/F-mouthrinse compared with sole CHX- and placebo-application. *Oral Health Prev Dent* 2006; 4(4): 255-63.

107. I. G. Chestnutt. Chlorhexidine varnish has caries-reducing potential. *Evid Based Dent* 2006; 7(4): 93.
108. C. Heyduck, C. Meller, C. Schwahn and C. H. Splieth. Effectiveness of sealants in adolescents with high and low caries experience. *Caries Res* 2006; 40(5): 375-81.
109. A. S. Pinto, F. B. de Araujo, R. Franzon, M. C. Figueiredo, S. Henz, F. Garcia-Godoy and M. Maltz. Clinical and microbiological effect of calcium hydroxide protection in indirect pulp capping in primary teeth. *Am J Dent* 2006; 19(6): 382-6.
110. S. Poulsen, L. Laurberg, M. Vaeth, U. Jensen and D. Haubek. A field trial of resin-based and glass-ionomer fissure sealants: clinical and radiographic assessment of caries. *Community Dent Oral Epidemiol* 2006; 34(1): 25-9.
111. M. Kaurani and S. V. Bhagwat. Clinical evaluation of postoperative sensitivity in composite resin restorations using various liners. *New York state dental journal* 2007; 73(2): 23-9.
112. M. Peumans, J. Munck, K. Landuyt, P. Lambrechts and B. Meerbeek. Five-year clinical effectiveness of a two-step self-etching adhesive. *Journal of adhesive dentistry* 2007; 9(1): 7-10.
113. D. Evans. APF foam does reduce caries in primary teeth. *Evid Based Dent* 2007; 8(1): 7.
114. K. A. Hassan and S. E. Khier. Split-increment technique: an alternative approach for large cervical composite resin restorations. *J Contemp Dent Pract* 2007; 8(2): 121-8.
115. A. S. Hochstetter, M. J. Lombardo, L. D'Eramo, S. Piovano and N. Bordoni. Effectiveness of a preventive educational programme on the oral health of preschool children. *Promot Educ* 2007; 14(3): 155-8.
116. H. Jiang, B. J. Tai, M. Q. Du, W. Huang and Y. Guo. [A two-year randomized clinical trial of 1.23% fluoride foam on dental caries increment in primary teeth]. *Zhonghua Kou Qiang Yi Xue Za Zhi* 2007; 42(8): 456-9.
117. G. D. Slade, R. G. Rozier, L. P. Zeldin and P. A. Margolis. Training pediatric health care providers in prevention of dental decay: results from a randomized controlled trial. *BMC Health Serv Res* 2007; 7(176): .
118. A. Weitz, M. I. Marinanco and A. Villa. Reduction of caries in rural school-children exposed to fluoride through a milk-fluoridation programme in Araucania, Chile. *Community Dent Health* 2007; 24(3): 186-91.
119. W. Dukic and D. Glavina. Clinical evaluation of three fissure sealants: 24 month follow-up. *European archives of paediatric dentistry* 2007; 8(3): 163-3.
120. C. M. Carrillo, M. H. Tanaka, M. F. Cesar, M. A. Camargo, Y. Juliano and N. F. Novo. Use of papain gel in disabled patients. *Journal of dentistry for children (Chicago, Ill.)* 2008; 75(3): 222-8.

121. S. M. Hassan, E. H. Mobarak and E. M. Fawzi. The efficacy of different regimens of chlorhexidine as an antimicrobial agent for a group of Egyptians. *J Egypt Public Health Assoc* 2008; 83(5-6): 435-50.
122. G. Minah, C. Lin, S. Coors, I. Rambob, N. Tinanoff and L. K. Grossman. Evaluation of an early childhood caries prevention program at an urban pediatric clinic. *Pediatr Dent* 2008; 30(6): 499-504.
123. J. Rodgers. Fluoride varnish as a public health measure to reduce caries. *Evid Based Dent* 2008; 9(1): 9-10.
124. S. Koubi, A. Raskin, J. Dejou, I. About, H. Tassery, J. Camps and J. P. Proust. Effect of Dual Cure Composite as Dentin Substitute on Marginal Integrity of Class II Open-Sandwich Restorations. *Operative Dentistry* 2009; 34(2): 150-156.
125. N. N. Maserejian, M. A. Tavares, C. Hayes, J. A. Soncini and F. L. Trachtenberg. Prospective study of 5-year caries increment among children receiving comprehensive dental care in the New England children's amalgam trial. *Community dentistry and oral epidemiology* 2009; 37(1): 9-18.
126. R. Franzon, M. Gomes, C. M. Pitoni, C. P. Bergmann and F. B. Araujo. Dentin rehardening after indirect pulp treatment in primary teeth. *J Dent Child (Chic)* 2009; 76(3): 223-8.
127. A. A. Mariath, A. N. Haas, C. M. Fischer, F. B. de Araujo and C. K. Rosing. Professional toothbrushing as a method for diagnosing gingivitis in 3- to 6-year-old preschool children. *Oral Health Prev Dent* 2009; 7(4): 315-21.
128. A. Nakamura, S. Sakuma, A. Yoshihara, T. Deguchi, M. Yagi and H. Miyazaki. Long-term follow-up of the effects of a school-based caries preventive programme involving fluoride mouth rinse and targeted fissure sealant: evaluation at 20 years old. *Int Dent J* 2009; 59(4): 215-21.
129. J. J. Paszynska E., Dyszkiewicz-Konwinska M., Mehr K. . Assessment of preventive oral health program in patients with mental retardation. <Ocena programu profilaktycznego zdrowia jamy ustnej u pacjentów niepełnosprawnych intelektualnie.> . *Pediatrics i Medycyna Rodzinna*. 2009; 5(4): 271-275.
130. V. Qvist, A. Poulsen, P. T. Teglers and I. A. Mjor. The longevity of different restorations in primary teeth. *Int J Paediatr Dent* 2010; 20(1): 1-7.
131. C. Abuchaim, M. Rotta, R. H. Grande, A. D. Loguercio and A. Reis. Effectiveness of sealing active proximal caries lesions with an adhesive system: 1-year clinical evaluation. *Braz Oral Res* 2010; 24(3): 361-7.
132. A. H. Al Mulla, S. A. Kharsa and D. Birkhed. Modified fluoride toothpaste technique reduces caries in orthodontic patients: A longitudinal, randomized clinical trial. *Am J Orthod Dentofacial Orthop* 2010; 138(3): 285-91.
133. E. Bresciani, W. C. Wagner, M. F. Navarro, S. H. Dickens and M. C. Peters. In vivo dentin microhardness beneath a calcium-phosphate cement. *J Dent Res* 2010; 89(8): 836-41.
134. D. Torres-Lagares, J. L. Gutierrez-Perez, P. Hita-Iglesias, N. Magallanes-Abad, R. Flores-Ruiz, M. Basallote-Garcia and M. Gonzalez-Martin. Randomized, double-blind study of effectiveness of intra-

alveolar application of chlorhexidine gel in reducing incidence of alveolar osteitis and bleeding complications in mandibular third molar surgery in patients with bleeding disorders. *J Oral Maxillofac Surg* 2010; 68(6): 1322-6.

135. M. N. Aboushelib. Clinical performance of self-etching adhesives with saliva contamination. *J Adhes Dent* 2011; 13(5): 489-93.

136. S. Asokan, R. S. Kumar, P. Emmadi, R. Raghuraman and N. Sivakumar. Effect of oil pulling on halitosis and microorganisms causing halitosis: a randomized controlled pilot trial. *J Indian Soc Pedod Prev Dent* 2011; 29(2): 90-4.

137. E. C. Lula, L. J. Almeida, Jr., C. M. Alves, V. Monteiro-Neto and C. C. Ribeiro. Partial caries removal in primary teeth: association of clinical parameters with microbiological status. *Caries Res* 2011; 45(3): 275-80.

138. H. Z. Cao, C. B. Shu, S. Wang and W. Huang. [Clinical evaluation of pit and fissure sealant with light-cured flowable resin and light-cured pit and fissure sealants]. *Shanghai Kou Qiang Yi Xue* 2011; 20(5): 545-7.

139. F. Ren, J. p. Liu, S. h. Huang, Y. r. Li, W. h. Fan, X. c. Chen and Q. Chen. Application of glass ionomer and light-cured resin sealant to the pit and fissure of deciduous teeth. *Journal of Clinical Rehabilitative Tissue Engineering Research* 2011; 15(38): 7165-7169.

140. C. Steiner-Oliveira, A. C. C. Aranha, A. C. Ribeiro, M. P. Mayer and C. P. Eduardo. In vivo randomized antimicrobial effect of the photodynamic therapy on deciduous carious dentin. *Medicina oral, patologia oral y cirugia bucal* 2012; 17(S220): .

141. K. Divaris, R. G. Rozier and R. S. King. Effectiveness of a school-based fluoride mouthrinse program. *J Dent Res* 2012; 91(3): 282-7.

142. B. Duane. 5,000 ppm F dentifrice for caries prevention in adolescents. *Evid Based Dent* 2012; 13(2): 43-4.

143. C. H. Splieth, A. Treuner, T. Gedrange and C. Berndt. Caries-preventive and remineralizing effect of fluoride gel in orthodontic patients after 2 years. *Clin Oral Investig* 2012; 16(5): 1395-9.

144. Q. L. Xu and P. H. Ji. [Clinical effect of pit and fissure sealant used in combination with different etching adhesive and 3M-Z350 flowable resin on young permanent teeth]. *Shanghai Kou Qiang Yi Xue* 2012; 21(5): 563-5.

145. A. Mena-Serrano, C. Kose, E. A. Paula, L. Y. Tay, A. Reis, A. D. Loguercio and J. Perdigão. A new universal simplified adhesive: 6-month clinical evaluation. *Journal of esthetic and restorative dentistry* 2013; 25(1): 55-69.

146. N. Gugnani. Trial shows caries reductions at one year in school-based sealant programme. *Evid Based Dent* 2013; 14(3): 71.

147. M. L. Laitala, P. Alanen, P. Isokangas, E. Soderling and K. Pienihakkinen. Long-term effects of maternal prevention on children's dental decay and need for restorative treatment. *Community Dent Oral Epidemiol* 2013; 41(6): 534-40.
148. V. Pitchika, C. J. Kokel, J. Andreeva, A. Crispin, R. Hickel, J. Kuhnisch and R. Heinrich-Weltzien. Effectiveness of a new fluoride varnish for caries prevention in pre-school children. *J Clin Pediatr Dent* 2013; 38(1): 7-12.
149. L. Rosenberg, M. Atar, M. Daronch, A. Honig, M. Chey, M. D. Funny and L. Cruz. Observational: prospective study of indirect pulp treatment in primary molars using resin-modified glass ionomer and 2% chlorhexidine gluconate: a 12-month Follow-up. *Pediatr Dent* 2013; 35(1): 13-7.
150. N. Sartori, S. C. Stolf, S. B. Silva, G. C. Lopes and M. Carrilho. Influence of chlorhexidine digluconate on the clinical performance of adhesive restorations: a 3-year follow-up. *J Dent* 2013; 41(12): 1188-95.
151. I. R. Blum and C. D. Lynch. Repair versus replacement of defective direct dental restorations in posterior teeth of adults. *Prim Dent J* 2014; 3(2): 62-7.
152. Y. Allen and B. Duane. Risk-based caries prevention may be more effective in children. *Evid Based Dent* 2014; 15(2): 41-2.
153. K. Bansal, N. Balhara and M. Marwaha. Remineralizing efficacy of Calcareo Fluorica tablets on the artificial carious enamel lesions using scanning electron microscope and surface microhardness testing: in vivo study. *Indian J Dent Res* 2014; 25(6): 777-82.
154. A. J. Keightley and G. D. Taylor. Fluoride varnish applications and caries incidence in pre-schoolers. *Evid Based Dent* 2014; 15(3): 83-4.
155. M. L. Mei, L. Ito, Y. Cao, E. C. Lo, Q. L. Li and C. H. Chu. An ex vivo study of arrested primary teeth caries with silver diamine fluoride therapy. *J Dent* 2014; 42(4): 395-402.
156. B. Y. Liu, Y. Xiao, C. H. Chu and E. C. Lo. Glass ionomer ART sealant and fluoride-releasing resin sealant in fissure caries prevention--results from a randomized clinical trial. *BMC Oral Health* 2014; 14(54): .
157. W. Lee, C. Spiekerman, M. Heima, H. Eggertsson, G. Ferretti, P. Milgrom and S. Nelson. The effectiveness of xylitol in a school-based cluster-randomized clinical trial. *Caries Res* 2015; 49(1): 41-9.
158. A. F. Montagner, A. P. Perroni, M. B. Correa, A. S. Masotti, T. Pereira-Cenci and M. S. Cenci. Effect of pre-treatment with chlorhexidine on the retention of restorations: a randomized controlled trial. *Braz Dent J* 2015; 26(3): 234-41.
159. J. H. Vermaire, C. van Loveren, W. B. Brouwer and M. Krol. [The cost-effectiveness evaluation of 2 caries prevention strategies compared with the standard approach]. *Ned Tijdschr Tandheelkd* 2015; 122(7-8): 392-401.

